

DEC 08 2006

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
6 March 2003 (06.03.2003)

PCT

(10) International Publication Number
WO 03/019377 A3(51) International Patent Classification⁷: G05B 23/02, 9/02LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG,
SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC,
VN, YU, ZA, ZM, ZW.

(21) International Application Number: PCT/IB02/03409

(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK,
TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

(22) International Filing Date: 7 August 2002 (07.08.2002)

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for all designations
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations

(25) Filing Language: English

Published:

- with International search report

(26) Publication Language: English

(88) Date of publication of the international search report:
25 September 2003

(30) Priority Date:

09/934,000 21 August 2001 (21.08.2001) US
01/16995 28 December 2001 (28.12.2001) FR

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(71) Applicant: IDTECT [FR/FR]; 19, Avenue de Friedland,
F-75008 Paris (FR).(72) Inventor: NICK, Sascha; Idtect, 19, Avenue de Friedland,
F-75008 Paris (FR).(74) Agents: MARTIN, Jean-Jacques et al.; Cabinet Regimeau,
20, rue de Chazelles, F-75847 Paris Cedex 17 (FR).(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DB, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,

WO 03/019377 A3

(54) Title: SYSTEM AND METHOD FOR SCALABLE MULTI-LITE, REMOTE DIAGNOSIS AND PREDICTIVE MAINTENANCE

(57) Abstract: A system and method for remote diagnosis and predictive maintenance of devices, machines, and systems has been presented. The system detects signals of one or more operating and condition parameters and compares the detected signals to a signal model maintained locally with respect to the location of the device, machine, or system for anomalies. Information describing each anomaly is transmitted to a location remote from the device, machine, or system for diagnosis. The diagnosis includes an initial analysis of the information by diagnostic tools maintained at the remote location, a subsequent analysis of the information by diagnostic tools maintained elsewhere if the initial analysis fails to provide a diagnosis and a final analysis by a team of humans aided by a collaborative environment if the initial and subsequent analyses fail to provide a diagnosis. The diagnosis is transmitted to a maintenance service for repair of the device, machine, or system.

INTERNATIONAL SEARCH REPORT

Int'l Application No	PCT/IB 02/03409
----------------------	-----------------

A. CLASSIFICATION OF SUBJECT MATTER		
IPC 7	G05B23/02	G05B9/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G05B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)
--

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT
--

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 97 15009 A (SYSTEMSOFT CORP) 24 April 1997 (1997-04-24) page 9, line 19 -page 12, line 5 ---	1-3
Y	WO 98 39718 A (EMERSON ELECTRIC CO) 11 September 1998 (1998-09-11) claim 1 page 8, line 3 - line 17 ---	1-3
A	EP 0 626 697 A (HITACHI LTD) 30 November 1994 (1994-11-30) page 6, line 26 -page 7, line 20 ---	1,7
A	EP 0 965 897 A (NELES CONTROLS OY) 22 December 1999 (1999-12-22) column 4, line 43 -column 10, line 53 ---	7
	-/-	

<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.
--

<input checked="" type="checkbox"/> Patent family members are listed in annex.
--

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the International filing date
- "L" document which may throw doubt on priority, claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"A" document member of the same patent family

Date of the actual completion of the International search

Date of mailing of the International search report
--

18 February 2003

06.05.2003

Name and mailing address of the ISA

Authorized officer

European Patent Office, P.B. 5818 Patenttaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 esp n. Fax: (+31-70) 340-6016
--

KELPERIS K.

Form PCT/ISA/210 (second sheet) (July 1992)

page 1 of 2

INTERNATIONAL SEARCH REPORT

Inte (a) Application No
PCT/IB 02/03409

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 181 975 B1 (MOTT JACK E ET AL) 30 January 2001 (2001-01-30) column 4, line 41 -column 8, line 15 ---	1,7
A	WO 01 48571 A (ASPEN TECHNOLOGY INC) 5 July 2001 (2001-07-05) page 8, line 16 -page 13, line 5 ---	1,7
A	US 5 311 562 A (PALUSAMY SAM S ET AL) 10 May 1994 (1994-05-10) -----	

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

page 2 of 2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB 02/03409

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-11

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
 No protest accompanied the payment of additional search fees.

International Application No. PCT/IB 02/03409

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-11

A method for remotely monitoring operations of a machine comprising: Detecting signals of the operating parameters of the machine, maintaining a model locally in order to identify anomalies by comparing the detected signals, transmitting relevant information to the remote location diagnosing the status of the machine using diagnostics tools and if a diagnosis fails to be implemented a final analysis is made by a team of humans and reports the diagnosis to a repairing station.

2. Claims: 12-19

A remote diagnostic tool for a machine connected via a communications link to a local monitoring tool. The remote diagnostic tool comprises: A first node for diagnosing the anomaly using tools available at the node, additional nodes on the network having access to additional diagnostic tools, interface between the first and the additional nodes and instructions at the first node for communicating the anomaly to one of the additional nodes if the tools at the first node fail to provide diagnosis.

3. Claims: 16-19

A remote diagnostic tool connected via a communications link to a local monitoring tool, the remote diagnostic tool comprises a local node diagnosing a machine anomaly including a first library of patterns describing systemic anomalies and a second library of patterns describing component anomalies and instructions at the node for diagnosing using first and second libraries

INTERNATIONAL SEARCH REPORT

Int'l Application No
PCT/IB 02/03409

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
WO 9715009	A	24-04-1997	AU WO	7448996 A 9715009 A1	07-05-1997 24-04-1997
WO 9839718	A	11-09-1998	AU EP WO	6686298 A 0965092 A1 9839718 A1	22-09-1998 22-12-1999 11-09-1998
EP 0626697	A	30-11-1994	JP JP DE DE EP US	3147586 B2 6331507 A 69404557 D1 69404557 T2 0626697 A1 5623109 A	19-03-2001 02-12-1994 04-09-1997 12-03-1998 30-11-1994 22-04-1997
EP 0965897	A	22-12-1999	FI DE EP US	981406 A 965897 T1 0965897 A1 6317701 B1	18-12-1999 17-08-2000 22-12-1999 13-11-2001
US 6181975	B1	30-01-2001	US AU CA EP JP KR WO	5764509 A 3396797 A 2257881 A1 0906593 A1 2000505221 T 2000022050 A 9749011 A1	09-06-1998 07-01-1998 24-12-1997 07-04-1999 25-04-2000 25-04-2000 24-12-1997
WO 0148571	A	05-07-2001	AU WO	2909001 A 0148571 A1	09-07-2001 05-07-2001
US 5311562	A	10-05-1994	NONE		